

CLAIMS

What Is Claimed Is:

1 Claim 1. A token dispensing device, comprising:

2 a storing bowl for storing and conducting tokens, the storing bowl including
3 an upper section that is open to receive tokens and a lower section that is open to discharge
4 tokens, the lower section having a convex section for restricting the movement of tokens out
5 of the lower section;

6 a rotating disk located below the storing bowl lower section, the rotating disk
7 having at least one through hole, the through hole for retaining and moving tokens;

8 a motor for rotating the rotating disk; and

9 a base plate located below the rotating disk,

10 wherein a token disposed in the through hole of the rotating disk is moved on
11 the base plate by the rotating disk to be dispensed one-by-one.

1 Claim 2. The token dispensing device of Claim 1,

2 wherein the storing bowl convex section includes

3 a circular lower opening located over the outer edge of the through hole,

4 a conically tapered section which extends upwards from the circular lower
5 opening, and

6 an enlarging section which is horn-like in shape and which extends upwards
7 from the conically tapered section, the enlarging section being located above the conically
8 tapered section,

9 wherein the junction of the conically tapered section and the enlarging section
10 forms an apex where the convex section has a minimum diameter.

1 Claim 3. The token dispensing device of Claim 2,

2 wherein the apex of the convex section is located above the base plate at a
3 distance approximately equal to the diameter of a token.

1 Claim 4. The token dispensing device of Claim 3,
2 wherein a space is enclosed by the convex section and the diameter of the
3 space enclosed by the convex section at the most narrow point is more than approximately
4 three times the diameter of a token.

1 Claim 5. The token dispensing device of Claim 4,
2 wherein the storing bowl has left and right side wall members which extend
3 vertically upwards from the enlarging section.

1 Claim 6. The token dispensing device of Claim 5,
2 wherein the rotating disk has a center section which extends upwards a
3 distance greater than the convex section, the rotating disk center section for agitating tokens
4 in the token storing bowl.

1 Claim 7. A token dispensing device, comprising:
2 a storing member for storing and conducting tokens, the storing member
3 including an upper section that is open to receive tokens and a lower section that is open to
4 discharge tokens, the lower section having a convex section for restricting the movement of
5 tokens out of the lower section;

6 a rotating disk for dispensing tokens one-by-one in a rotating manner, the
7 rotating disk having a first side and a second side, the rotating disk first side being disposed
8 adjacent to the lower section of the storing member, the rotating disk having at least one
9 through hole, each rotating disk through hole having a cone-shaped hollow, each rotating disk
10 through hole for receiving tokens, the rotating disk for rotating about an axis line, the axis
11 line extending in a direction to enter the storing member lower section opening;

12 a base plate located below the rotating disk second side, the base plate being a
13 planar surface adjacent to the rotating disk for supporting tokens disposed in the through hole
14 as the rotating disk is rotated and a token is dispensed; and
15 a motor for selectively rotating the rotating disk, the motor having a driven
16 shaft, the driven shaft being operatively coupled to the rotating disk.

1 Claim 8. The token dispensing device of Claim 7, further comprising:
2 a gear reduction unit disposed between the motor and the rotating disk, the
3 gear reduction unit for operatively coupling the motor to the rotating disk so that for every
4 rotation of the motor shaft the rotating disk makes less than one rotation.

1 Claim 9. The token dispensing device of Claim 7, further comprising:
2 a circular lower opening located on the lower section of the storing member,
3 the circular lower opening being located over the outer edge of the through hole as the
4 rotating disk is rotated;
5 a first tapered section which narrows in a upwards direction away from the
6 circular lower opening, the first tapered section being conically tapered; and
7 a second tapered section which widens in a upwards direction away from the
8 circular lower opening to form an enlarging section, the second tapered section being
9 mounted above the first tapered section,
10 wherein the junction of the first tapered section and the second tapered section
11 forms an interior circular apex of the convex section, the interior circular apex defining the
12 most narrow diameter of the convex section.

1 Claim 10. The token dispensing device of Claim 9,
2 wherein the ratio of the diameter of the interior circular apex of the convex
3 section to the diameter of a token is between approximately 3 to approximately 5.

1 Claim 11. The token dispensing device of Claim 9,
2 wherein the ratio of the diameter of the interior circular apex of the convex
3 section to the diameter of a token is approximately 4.3.

1 Claim 12. The token dispensing device of Claim 7,
2 wherein the storing member upper opening describes a substantially horizontal
3 plane and the rotating disk is inclined at a predetermined angle relative to the substantially
4 horizontal plane, the storing member lower section opening being aligned with the rotating
5 disk.

1 Claim 13. The token dispensing device of Claim 12,
2 wherein the predetermined angle is approximately 30 degrees.

1 Claim 14. The token dispensing device of Claim 7,
2 wherein the cone-shaped hollow is formed off-center with the center of the
3 through hole, the center of the cone-shaped hollow being off-set by a small amount in the
4 direction of rotation of the rotating disk in order to form a more gradual slope on the leading
5 edge of the through hole and a more steep slope on the trailing edge of the through hole.

1 Claim 15. The token dispensing device of Claim 7,
2 wherein tokens in proximity to the convex section form a quasi-jamming
3 condition, the quasi-jamming condition being a bridging of adjacent tokens spanning the
4 width of the convex section above the rotating disk.

1 Claim 16. The token dispensing device of Claim 7,
2 wherein the storing member is composed of resin and is formed by injection
3 molding.

1 Claim 17. The token dispensing device of Claim 7,
2 wherein the rotating disk is composed of resin and is formed by injection
3 molding.

1 Claim 18. The token dispensing device of Claim 7,
2 wherein the base plate is composed of resin and is formed by injection
3 molding.

1 Claim 19. In a token dispensing device having a hopper for storing tokens and a
2 dispenser for dispensing tokens, the hopper having an upper opening and a lower
3 opening, the improvement comprising:
4 a convex section disposed in between the hopper lower opening and the
5 dispenser, the convex section for impeding the flow of tokens from the hopper to the
6 dispenser by creating a quasi-jamming condition, the quasi-jamming condition being a
7 bridging of adjacent tokens spanning the width of the convex section above the dispenser.

1 Claim 20. The token dispensing device of Claim 19,
2 wherein the convex section includes a first tapered section which narrows in a
3 direction away from the hopper lower opening, the first tapered section being conically
4 tapered; and

5 a second tapered section which widens in a direction away from the hopper
6 lower opening to form an enlarging section, the second tapered section being mounted above
7 the first tapered section,

8 wherein the junction of the first tapered section and the second tapered section
9 forms an interior circular apex of the convex section, the interior circular apex defining the
10 most narrow diameter of the convex section.

- 1 Claim 21. The token dispensing device of Claim 19, further comprising:
- 2 an agitator for agitating tokens in the hopper.